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IEEE JNL IEEE Journal or Magazine

IEEE JNL IEEE Journal or Magazine

IEEE CNF IEEE Conference Proceeding

IEEE CNF IEEE Conference Proceeding

IEEE STD IEEE Standard

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Relevance scale ☐ ☐ ☐ ☐ ☐**1** [Cg: a system for programming graphics hardware in a C-like language](#)

William R. Mark, R. Steven Glanville, Kurt Akeley, Mark J. Kilgard

July 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 3Full text available: [pdf\(2.57 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The latest real-time graphics architectures include programmable floating-point vertex and fragment processors, with support for data-dependent control flow in the vertex processor. We present a programming language and a supporting system that are designed for programming these stream processors. The language follows the philosophy of C, in that it is a hardware-oriented, general-purpose language, rather than an application-specific shading language. The language includes a variety of facilities ...

**2** [A recent radical graphical approach to programming](#)

Alfred L. McKinney

June 2003 **Journal of Computing Sciences in Colleges**, Volume 18 Issue 6Full text available: [pdf\(44.13 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper provides a very brief overview of the history of graphical approaches to programming. A more detailed description is given of SoftWIRE, a recent radical graphical approach to programming, which has much potential. SoftWIRE utilizes Visual Basic (VB) in the Integrated Development Environment (IDE) Microsoft Visual Studio .NET. The description of SoftWIRE provides details, advantages, and program examples. Predictions are made on the development and the future of graphical programming a ...

**3** [A real-time procedural shading system for programmable graphics hardware](#)

Kekoa Proudfoot, William R. Mark, Svetoslav Tzvetkov, Pat Hanrahan

August 2001 **Proceedings of the 28th annual conference on Computer graphics and interactive techniques**Full text available: [pdf\(1.20 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Real-time graphics hardware is becoming programmable, but this programmable hardware is complex and difficult to use given current APIs. Higher-level abstractions would both increase programmer productivity and make programs more portable. However, it is challenging to raise the abstraction level while still providing high performance. We have developed a real-time procedural shading language system designed to achieve this goal.

Our system is organized around multiple *computation* ...

**Keywords:** *graphics hardware, graphics systems, rendering, shading languages*

4 Graphics Programming Using the Core System

R. Daniel Bergeron, Peter R. Bono, James D. Foley

December 1978 **ACM Computing Surveys (CSUR)**, Volume 10 Issue 4

Full text available:  [pdf\(2.92 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)




5 An object-oriented framework for graphical programming (summary paper)

Steven P. Reiss

June 1986 **ACM SIGPLAN Notices , Proceedings of the 1986 SIGPLAN workshop on**

**Object-oriented programming**, Volume 21 Issue 10

Full text available:  [pdf\(838.85 KB\)](#)


Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)




6 Large meshes and GPU programming: Brook for GPUs: stream computing on graphics hardware

Ian Buck, Tim Foley, Daniel Horn, Jeremy Sugerman, Kayvon Fatahalian, Mike Houston, Pat Hanrahan

August 2004 **ACM Transactions on Graphics (TOG)**, Volume 23 Issue 3

Full text available:  [pdf\(266.63 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

 [mov\(21:31 MIN\)](#)

[terms](#)

In this paper, we present Brook for GPUs, a system for general-purpose computation on programmable graphics hardware. Brook extends C to include simple data-parallel constructs, enabling the use of the GPU as a streaming co-processor. We present a compiler and runtime system that abstracts and virtualizes many aspects of graphics hardware. In addition, we present an analysis of the effectiveness of the GPU as a compute engine compared to the CPU, to determine when the GPU can outperform the CPU ...

**Keywords:** Data Parallel Computing, GPU Computing, Brook, Programmable Graphics Hardware, Stream Computing




7 A graphics-based programming-support system

H. P. Frei, D. L. Weller, R. Williams

August 1978 **ACM SIGGRAPH Computer Graphics , Proceedings of the 5th annual**

**conference on Computer graphics and interactive techniques**, Volume 12 Issue

3

Full text available:  [pdf\(1.52 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


A programming support system using extended Nassi-Shneiderman diagrams (NSD) is described. The aim of the work is to develop techniques for improving the quality and cost of specifying, documenting and producing computer programs. NSD's can be executed interpretively or compiled to produce running code. The system implementation has begun and charts can be drawn on a variety of display devices. The system is being developed using the Picture Building System developed earlier.

**Keywords:** Interactive computer graphics, Nassi-Sneiderman diagrams, Program representation, Structured programming



**8 A graphical programming language interface for an intelligent LISP tutor**


B. J. Reiser, P. Friedmann, J. Gevins, D. Y. Kimberg, M. Ranney

May 1988 **Proceedings of the SIGCHI conference on Human factors in computing systems**Full text available:  [pdf\(655.66 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe an intelligent tutor for programming embedded in a graphical programming language. The tutor monitors students' problem solving and provides feedback and guidance. Explanations are generated from the content of the ideal model's problem solving rules. The graphical interface is designed to facilitate the acquisition of causal models of programming. Students work in a medium that corresponds to their planning operations. The interface enables forward and backward chaining, thus c ...

**9 Shading and shaders: Efficient partitioning of fragment shaders for multipass rendering on programmable graphics hardware**

Eric Chan, Ren Ng, Pradeep Sen, Keko Proudfoot, Pat Hanrahan

September 2002 **Proceedings of the ACM SIGGRAPH/EUROGRAPHICS conference on Graphics hardware**Full text available:  [pdf\(337.34 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Real-time programmable graphics hardware has resource constraints that prevent complex shaders from rendering in a single pass. One way to virtualize these resources is to partition shading computations into multiple passes, each of which satisfies the given constraints. Many such partitions exist for a shader, but it is important to find one that renders efficiently. We present Recursive Dominator Split (RDS), a polynomial-time algorithm that uses a cost model to find near-optimal partitions of ...

**Keywords:** graph partitioning algorithms, multipass rendering, programmable graphics hardware, shading languages

**10 Ray tracing on programmable graphics hardware**

Timothy J. Purcell, Ian Buck, William R. Mark, Pat Hanrahan

July 2002 **ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques**, Volume 21 Issue 3Full text available:  [pdf\(454.93 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Recently a breakthrough has occurred in graphics hardware: fixed function pipelines have been replaced with programmable vertex and fragment processors. In the near future, the graphics pipeline is likely to evolve into a general programmable stream processor capable of more than simply feed-forward triangle rendering. In this paper, we evaluate these trends in programmability of the graphics pipeline and explain how ray tracing can be mapped to graphics hardware. Using our simulator, we analyze ...

**Keywords:** programmable graphics hardware, ray tracing


**11 Learning, research, and the graphical representation of programming**

Robert P. Taylor, Nancy Cunniff, Minh Uchiyama

November 1986 **Proceedings of 1986 ACM Fall joint computer conference**Full text available:  [pdf\(789.06 KB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#)

**12 Why looking isn't always seeing: readership skills and graphical programming**

Marian Petre

June 1995 **Communications of the ACM**, Volume 38 Issue 6Full text available:  pdf(631.72 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Many believe that visual programming techniques are quite close to developers. This article reports on some fascinating research focusing on understanding how textual and visual representations for software differ in effectiveness. Among other things, it is determined that the differences lie not so much in the textual-visual distinction as in the degree to which specific representations support the conventions experts expect.

**13 HDR and tone mapping: Interactive time-dependent tone mapping using programmable graphics hardware**

Nolan Goodnight, Rui Wang, Cliff Woolley, Greg Humphreys

June 2003 **Proceedings of the 14th Eurographics workshop on Rendering EGRW '03**Full text available:  pdf(7.56 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Modern graphics architectures have replaced stages of the graphics pipeline with fully programmable modules. Therefore, it is now possible to perform fairly general computation on each vertex or fragment in a scene. In addition, the nature of the graphics pipeline makes substantial computational power available if the programs have a suitable structure. In this paper, we show that it is possible to cleanly map a state-of-the-art tone mapping algorithm to the pixel processor. This allows an inter ...

**14 Session II: Programming graphics processors functionally**

Conal Elliott

September 2004 **Proceedings of the ACM SIGPLAN workshop on Haskell**Full text available:  pdf(673.50 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Graphics cards for personal computers have recently undergone a radical transformation from fixed-function graphics pipelines to multi-processor, programmable architectures. Multi-processor architectures are clearly advantageous for graphics for the simple reason that graphics computations are naturally concurrent, mapping well to stateless stream processing. They therefore parallelize easily and need no random access to memory with its problematic latencies. This paper presents *Vertigo*, a ...

**Keywords:** 3D modeling, code generation, compilers, computer algebra, computer graphics, domain-specific languages, functional geometry, functional programming, graphics languages, graphics processors, partial evaluation, procedural geometry, procedural shading, shading languages

**15 GIDTS: a graphical programming environment for Prolog**

Gabriella Kókai, Jörg Nilson, Christian Niss

September 1999 **ACM SIGSOFT Software Engineering Notes , Proceedings of the 1999 ACM SIGPLAN-SIGSOFT workshop on Program analysis for software tools and engineering**, Volume 24 Issue 5Full text available:  pdf(1.47 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper puts forward the Graphical Interactive Diagnosing, Testing and Slicing System (*GIDTS*) which is a graphical programming environment for PROLOG programs. The *IDTS* part of the system integrates Shapiro's Interactive Diagnosis Algorithm with the Category Partition Testing Method (*CPM*) and a slicing technique performing the *algorithmic debugging* and *functional testing* of PROLOG programs. The integration of *IDTS* with a graphical user interface (*GU* ...



**16 Graphics Programming Using a Database System with Dependency Declarations**

M. T. Garrett, J. D. Foley

April 1982 **ACM Transactions on Graphics (TOG)**, Volume 1 Issue 2Full text available:  [pdf\(1.26 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**Keywords:** dependencies, nonprocedural programming, production rules**17 Shading, surfaces, and collision detection: Mesh mutation in programmable graphics hardware**


Le-Jeng Shiue, Vineet Goel, Jorg Peters

July 2003 **Proceedings of the ACM SIGGRAPH/EUROGRAPHICS conference on Graphics hardware**Full text available:  [pdf\(789.95 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

We show how a future graphics processor unit (GPU), enhanced with random read and write to video memory, can represent, refine and adjust complex meshes arising in modeling, simulation and animation. To leverage SIMD parallelism, a general model based on the mesh atlas is developed and a particular implementation without adjacency pointers is proposed in which primal, binary refinement of, possibly mixed, quadrilateral and triangular meshes of arbitrary topological genus, as well as their traversal ...

**18 Declarative programming of graphical interfaces by visual examples**

Ken Miyashita, Satoshi Matsuoka, Shin Takahashi, Akinori Yonezawa, Tomihisa Kamada

December 1992 **Proceedings of the 5th annual ACM symposium on User interface software and technology**Full text available:  [pdf\(1.26 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Graphical user interfaces (GUI) provide intuitive and easy means for users to communicate with computers. However, construction of GUI software requires complex programming that is far from being intuitive. Because of the "semantic gap" between the textual application program and its graphical interface, the programmer himself must conceptually maintain the correspondence between the textual programming and the graphical image of the resulting interface. Instead, we propose a programming by example approach ...

**Keywords:** constraints, direct manipulation, graphical user interface, layouts, programming by example, visualization**19 Simulation and computation: A multigrid solver for boundary value problems using programmable graphics hardware**


Nolan Goodnight, Cliff Woolley, Gregory Lewin, David Luebke, Greg Humphreys

July 2003 **Proceedings of the ACM SIGGRAPH/EUROGRAPHICS conference on Graphics hardware**Full text available:  [pdf\(2.80 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a case study in the application of graphics hardware to general-purpose numeric computing. Specifically, we describe a system, built on programmable graphics hardware, able to solve a variety of partial differential equations with complex boundary conditions. Many areas of graphics, simulation, and computational science require efficient techniques for solving such equations. Our system implements the **multigrid method**, a fast and popular approach to solving large boundary value problems ...

**20** A graphical programming environment in Ada

Jorge L. Diaz-Herrera, Shawna C. Gregory

March 1986 **Proceedings of the third annual Washington Ada symposium on Ada: Ada use in focus : practical lessons in perspective**Full text available:  [pdf\(632.20 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#)

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